

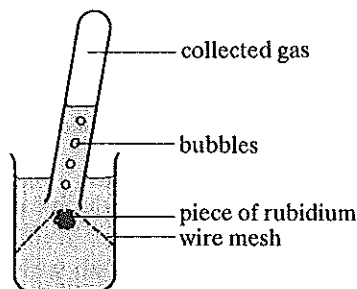
## Questions

- 1 Draw a table like the one below:

Reactions	Similarities	Differences
Sodium with water		
Calcium with water		

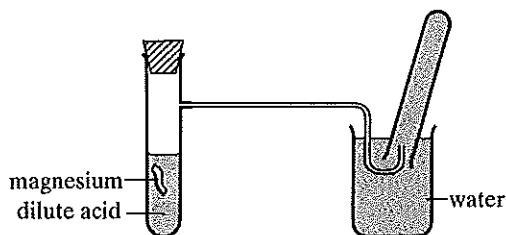
Fill in two ways in which the reactions are similar, and two ways in which the reactions are different.

- 2 Explain why we store sodium metal in jars of oil.
- 3 Draw another table like the one in question 1. This time, fill it in for the reactions of magnesium and zinc in steam.
- 4 Write an equation for the reaction of zinc with steam.
- 5 Rubidium is a metal in the same group as sodium (Group I). A small piece of rubidium is held beneath the surface of some water in a beaker, as shown in the diagram. **This experiment is dangerous. Do not try it for any Group I metals.**



- (a) What do you think the gas is?
- (b) How could you test for this gas?
- (c) What happens to the rubidium?
- (d) If universal indicator was added to the solution in the beaker, what colour would it go?
- (e) Why is the rubidium held under a wire mesh?
- 6 Look at this list of metals:  
iron aluminium zinc magnesium calcium copper
- (a) Which reacts most readily with water?
- (b) Which reacts least readily with water?
- (c) For which would you need concentrated acid to make the metal dissolve?

- 7 A piece of magnesium ribbon is dropped into the test-tube as shown in the diagram.



- (a) What happens to the magnesium?
- (b) What would you see happening to the liquid?
- (c) What would happen to the water in the upside-down tube?
- (d) Write an equation for this reaction.

- 8 (a) Copy out the table below:

Pure metal	put into an aqueous solution of		
	Hydrogen chloride	Zinc chloride	Copper(II) sulphate(VI)
Magnesium			
Iron			
Silver			
Lead			

If you think a reaction will take place when magnesium is put into an aqueous solution of hydrogen chloride, write Yes in the appropriate box. If not, write No. Repeat for all the metals and solutions.

- (b) What do you call this type of reaction?
- (c) Write an equation for each reaction that does take place.

- 9 Write in your own words what you think the electrochemical series is, and what patterns it shows.
- 10 Draw a simple diagram to show:
- (a) the electronic structure of a water molecule
- (b) the outer-shell electronic structure of a single magnesium atom
- (c) the effect that a magnesium atom has on a water molecule during the reaction of magnesium and steam
- (d) the electronic structure of the products of the reaction.
- 11 Men have known about and used gold, silver, copper, iron, and lead for thousands of years. Why have we only started using aluminium and titanium in the last hundred years?